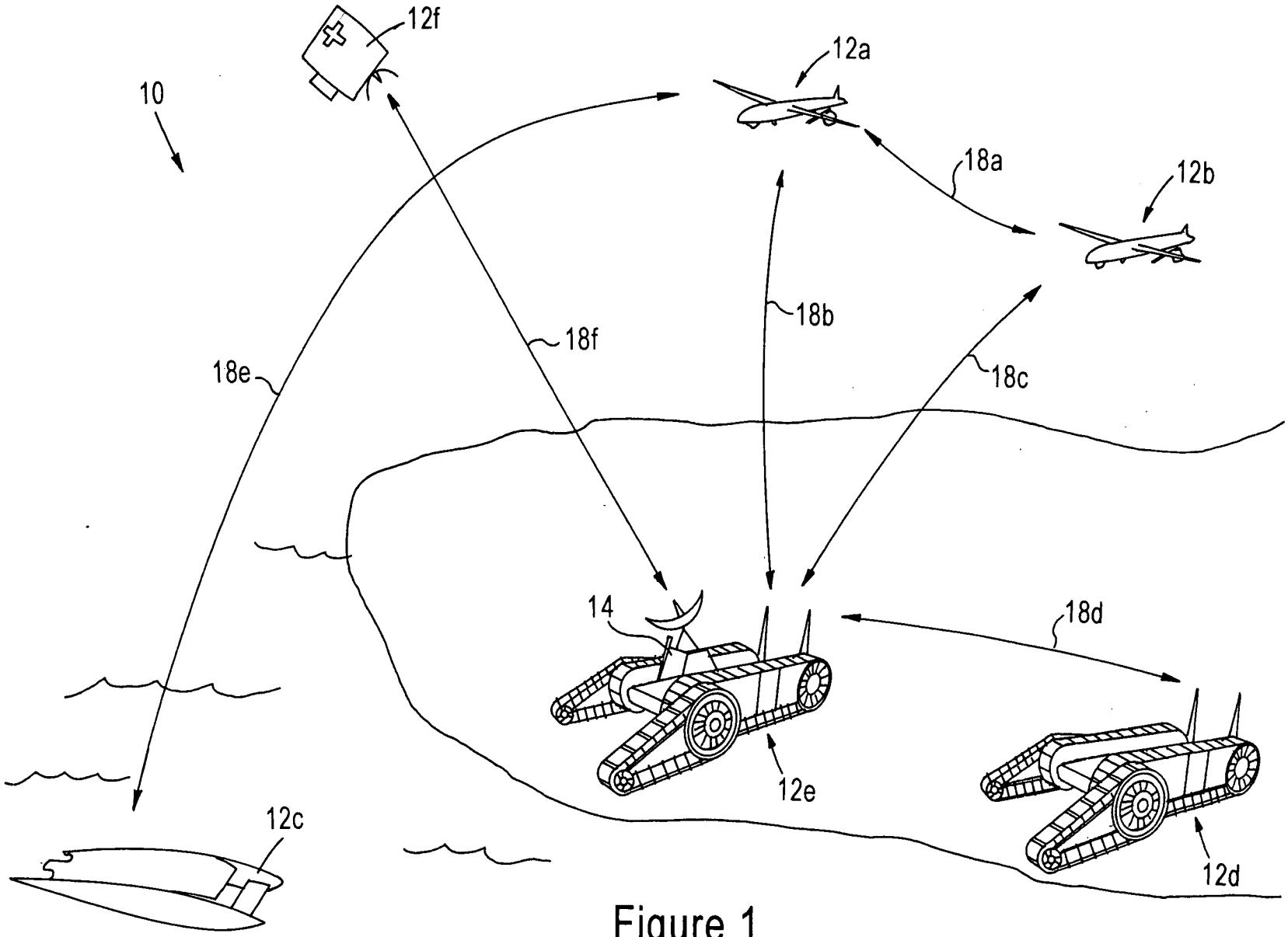

Figure 1

OIPE
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JC25

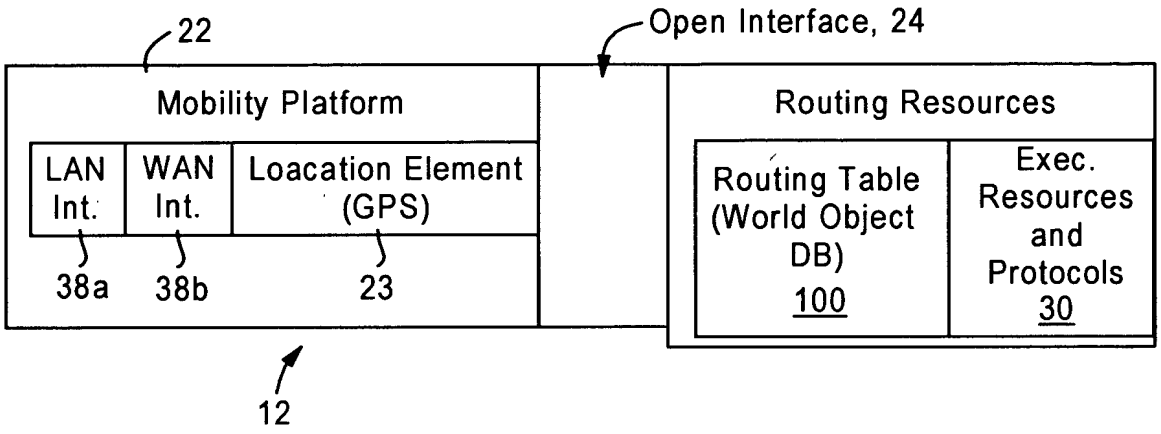
22
Open Interface, 24
Mobility Platform
LAN Int.
WAN Int.
Loacation Element (GPS)
38a
38b
23
Routing Resources
Routing Table (World Object DB)
100
Exec. Resources and Protocols
30
12

Figure 2

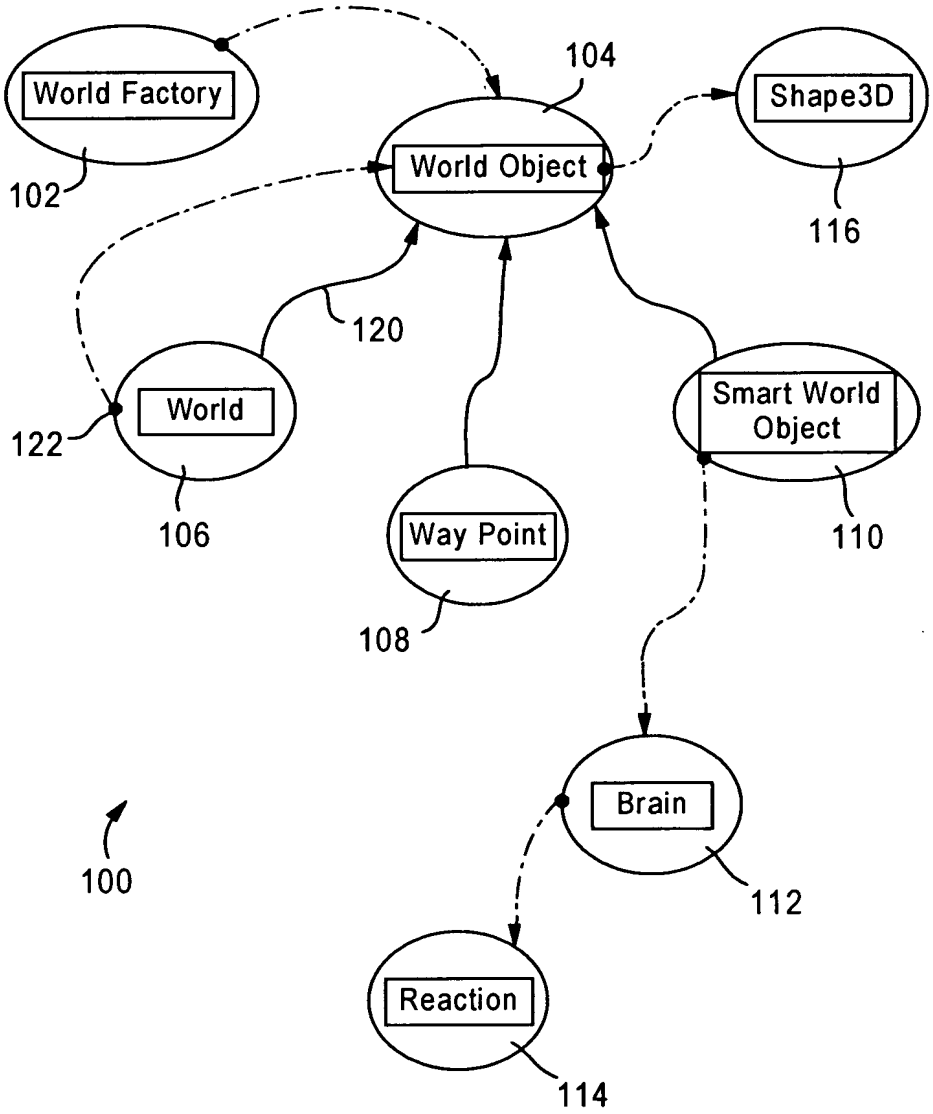
World Factory
102
104
World Object
Shape3D
116
120
World
122
106
Smart World Object
110
Way Point
108
Brain
112
100
Reaction
114

Figure 3

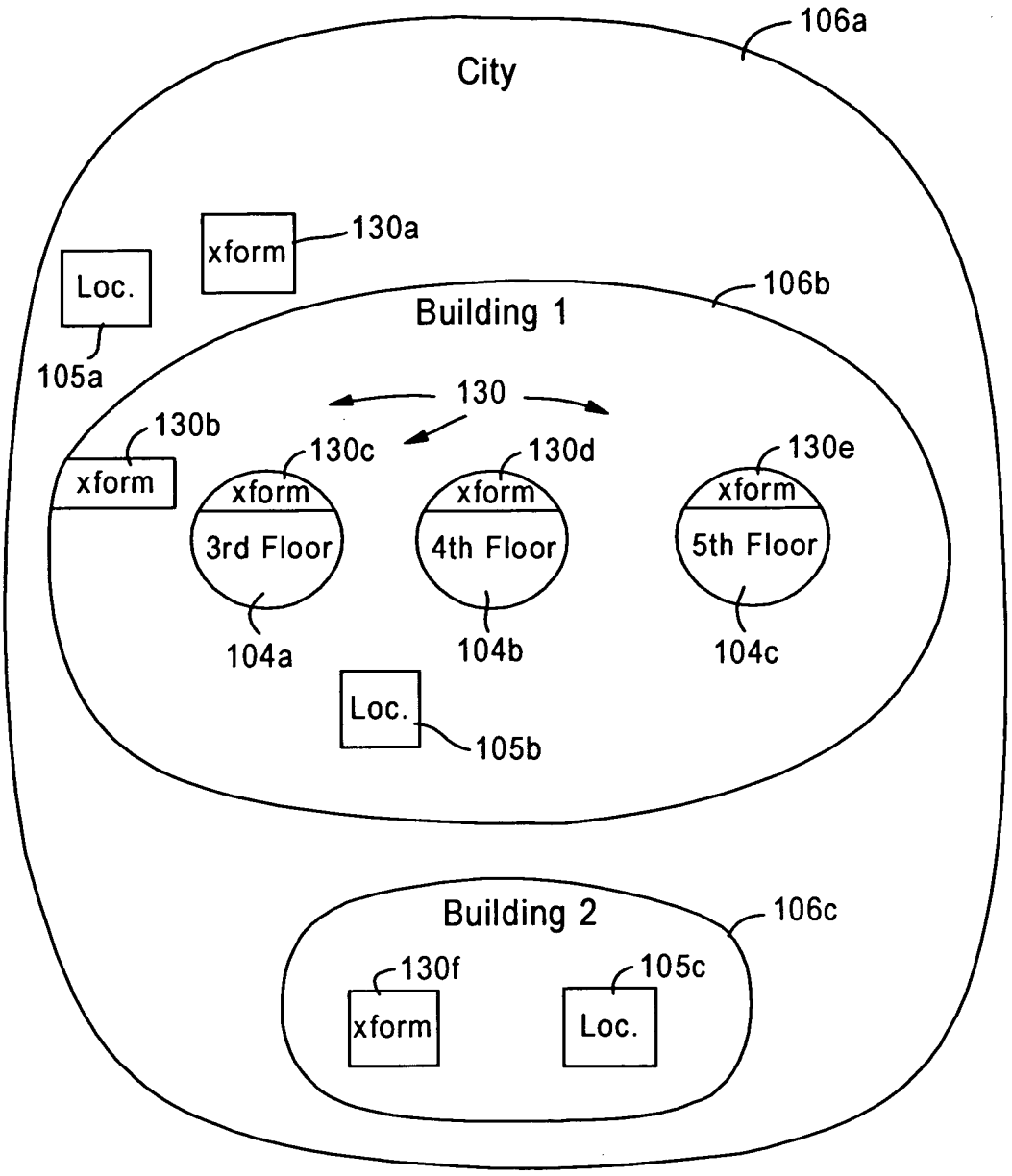
106a
City
xform
130a
Loc.
105a
106b
Building 1
130
130b
xform
130c
xform
3rd Floor
104a
130d
xform
4th Floor
104b
130e
xform
5th Floor
104c
Loc.
105b
Building 2
106c
130f
xform
105c
Loc.

Figure 4

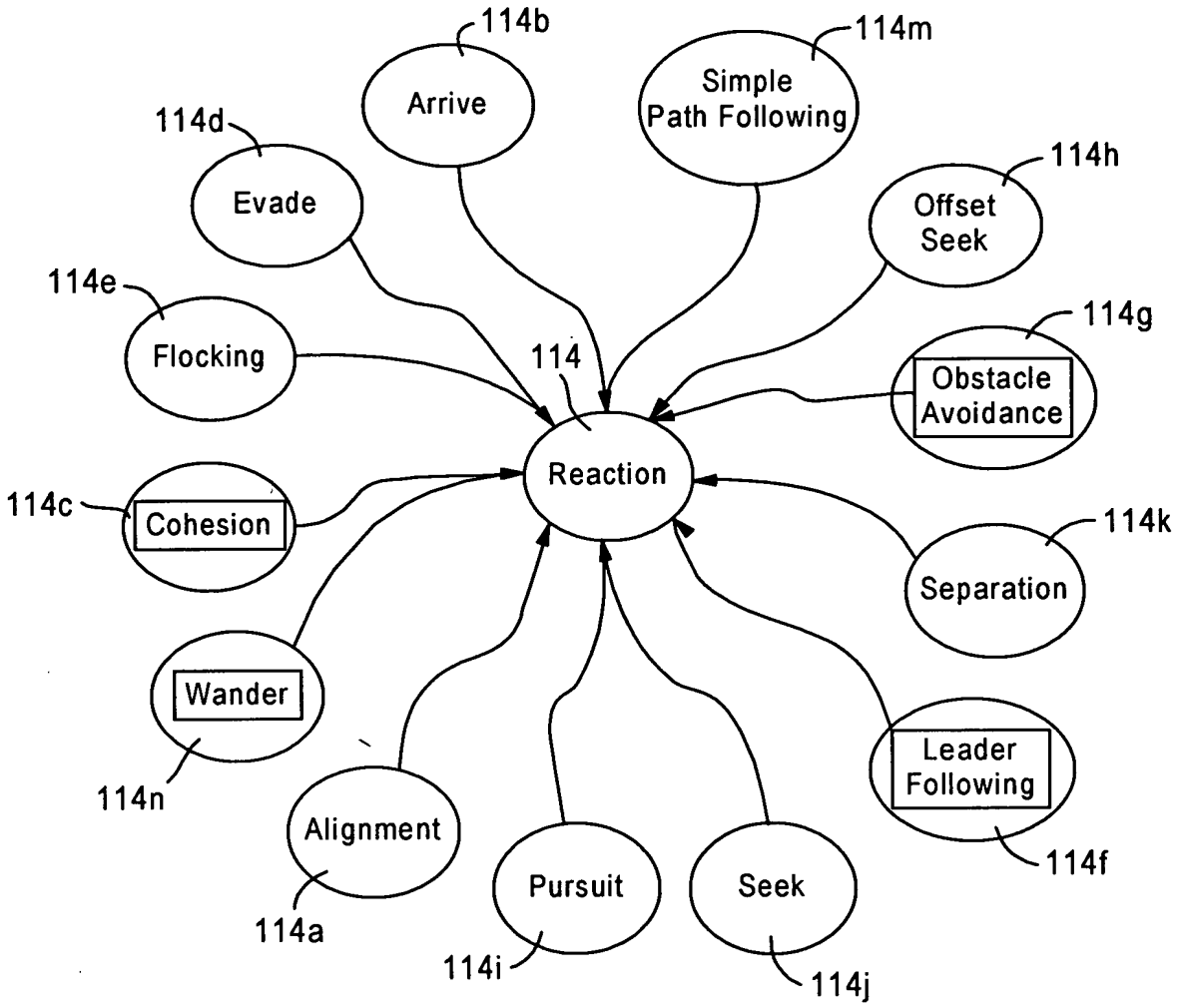
114b
Arrive
114m
Simple
Path Following
114d
Evade
114h
Offset
Seek
114e
Flocking
114
114g
Obstacle
Avoidance
Reaction
114c
Cohesion
114k
Separation
Wander
114n
Leader
Following
Alignment
Pursuit
Seek
114a
114i
114f
114j

Figure 5

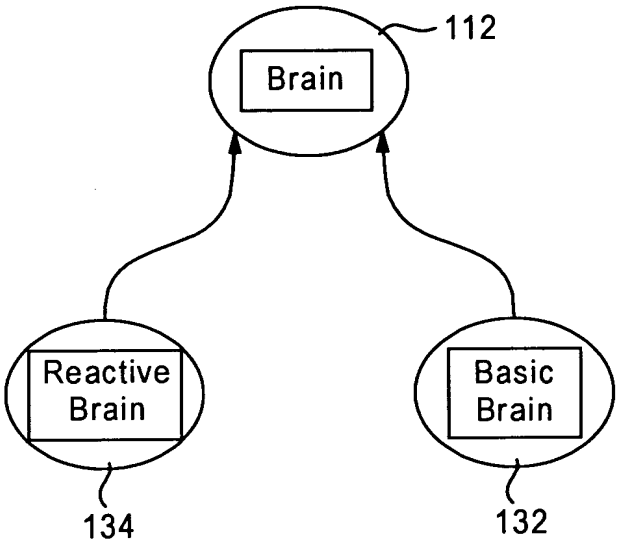

Figure 6

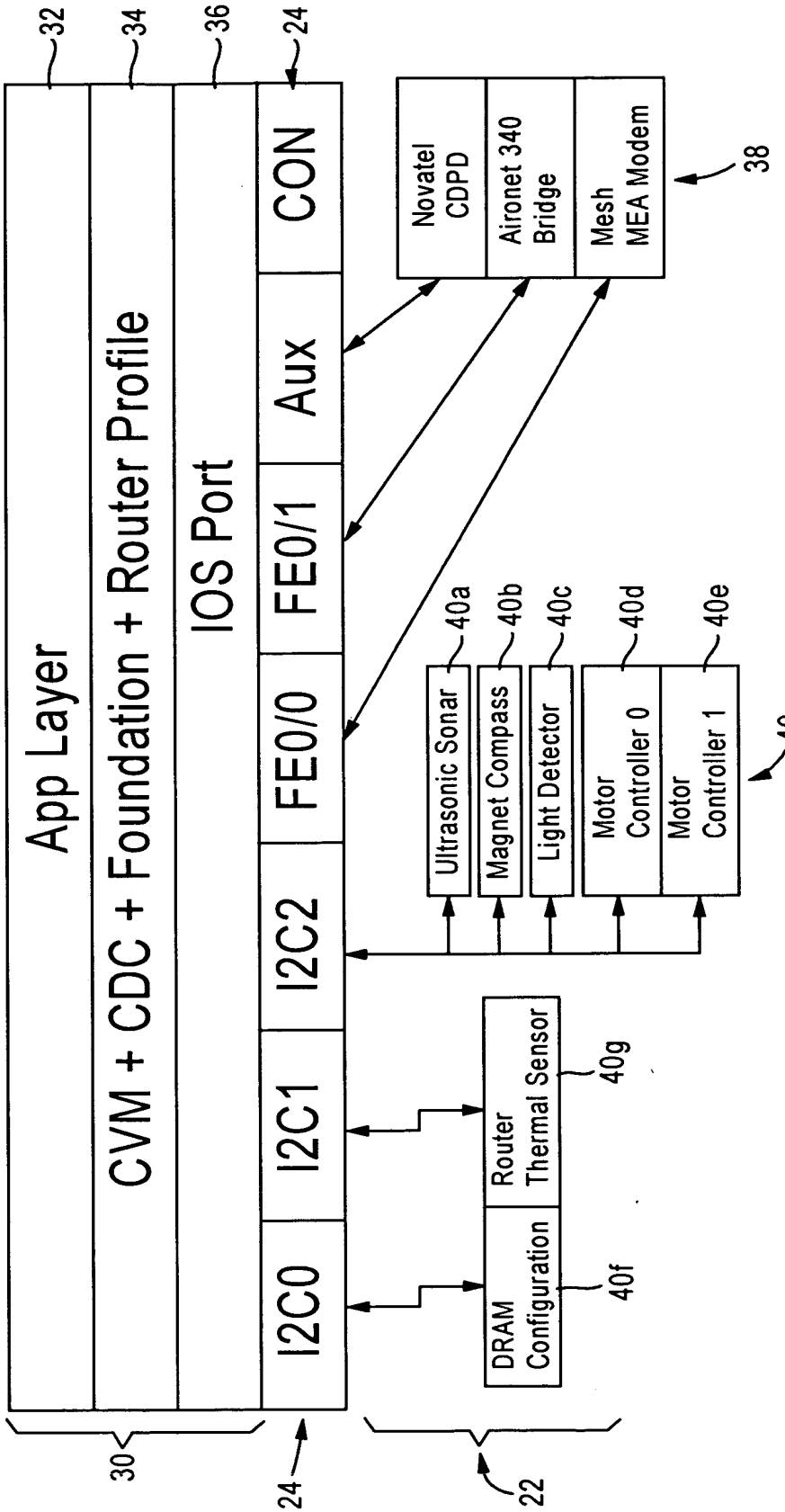
App Layer
CVM + CDC + Foundation + Router Profile
IOS Port
I2C0
I2C1
I2C2
FE0/0
FE0/1
Aux
CON
32
34
36
24
30
22
Novatel CDPD
Aironet 340 Bridge
Mesh MEA Modem
38
Ultrasonic Sonar
Magnet Compass
Light Detector
Motor Controller 0
Motor Controller 1
40a
40b
40c
40d
40e
40
DRAM Configuration
Router Thermal Sensor
40f
40g

Figure 7

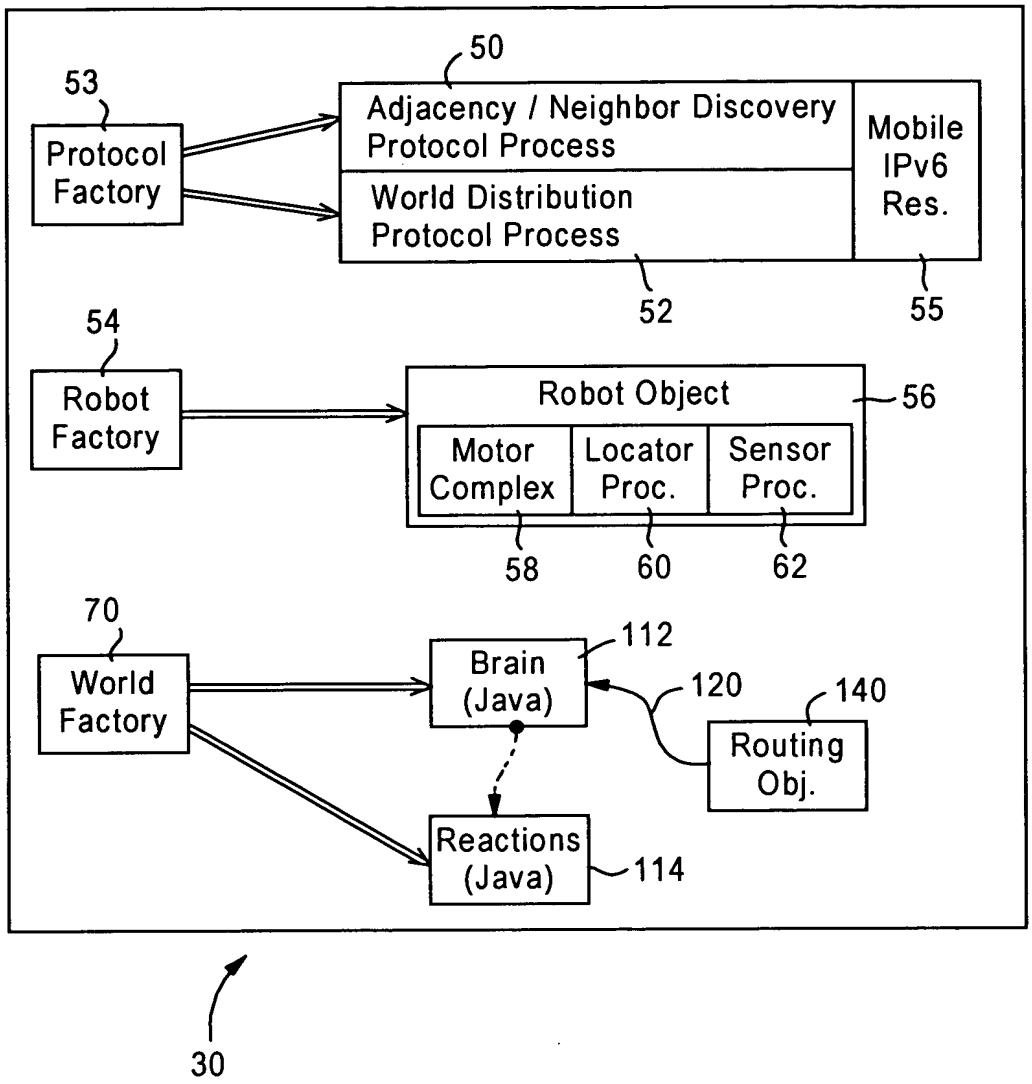
50
53
Protocol Factory
Adjacency / Neighbor Discovery Protocol Process
World Distribution Protocol Process
Mobile IPv6 Res.
52
55
54
Robot Factory
Robot Object
56
Motor Complex
Locator Proc.
Sensor Proc.
58
60
62
70
World Factory
Brain (Java)
112
120
140
Routing Obj.
Reactions (Java)
114
30

Figure 8

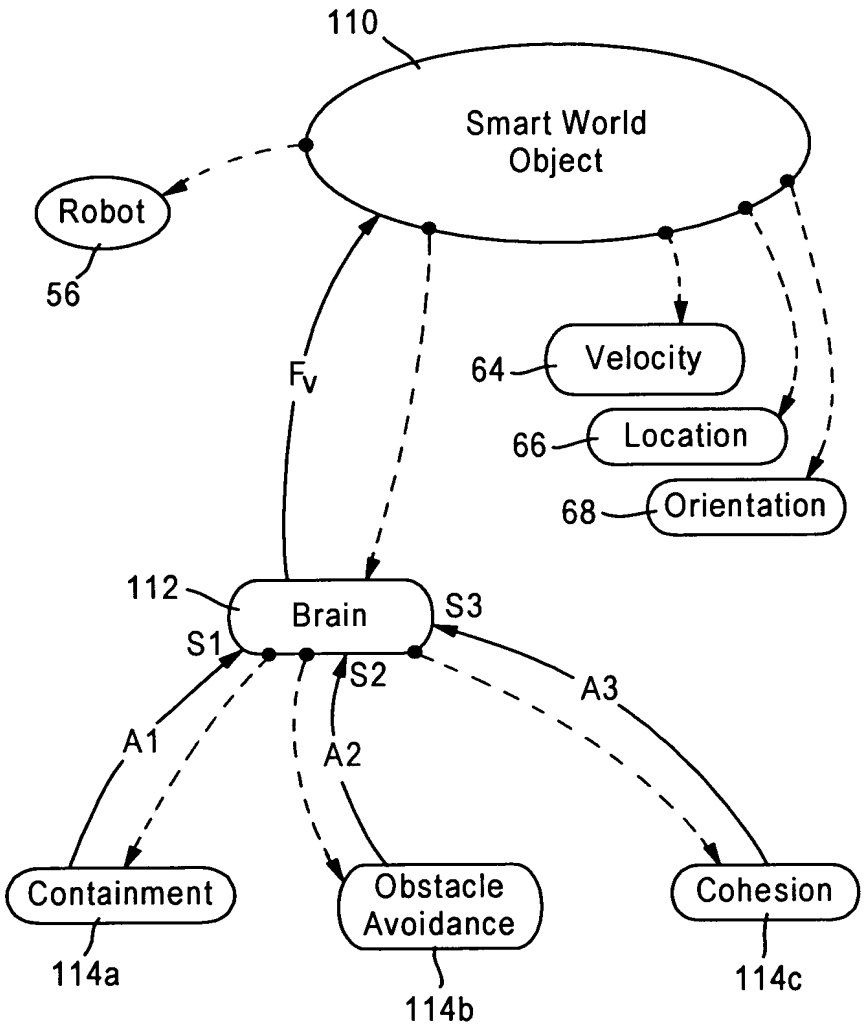
110
Smart World Object
Robot
56
F_v
64
Velocity
66
Location
68
Orientation
112
Brain
S1
S2
S3
A1
A2
A3
Containment
114a
Obstacle Avoidance
114b
Cohesion
114c

Figure 9

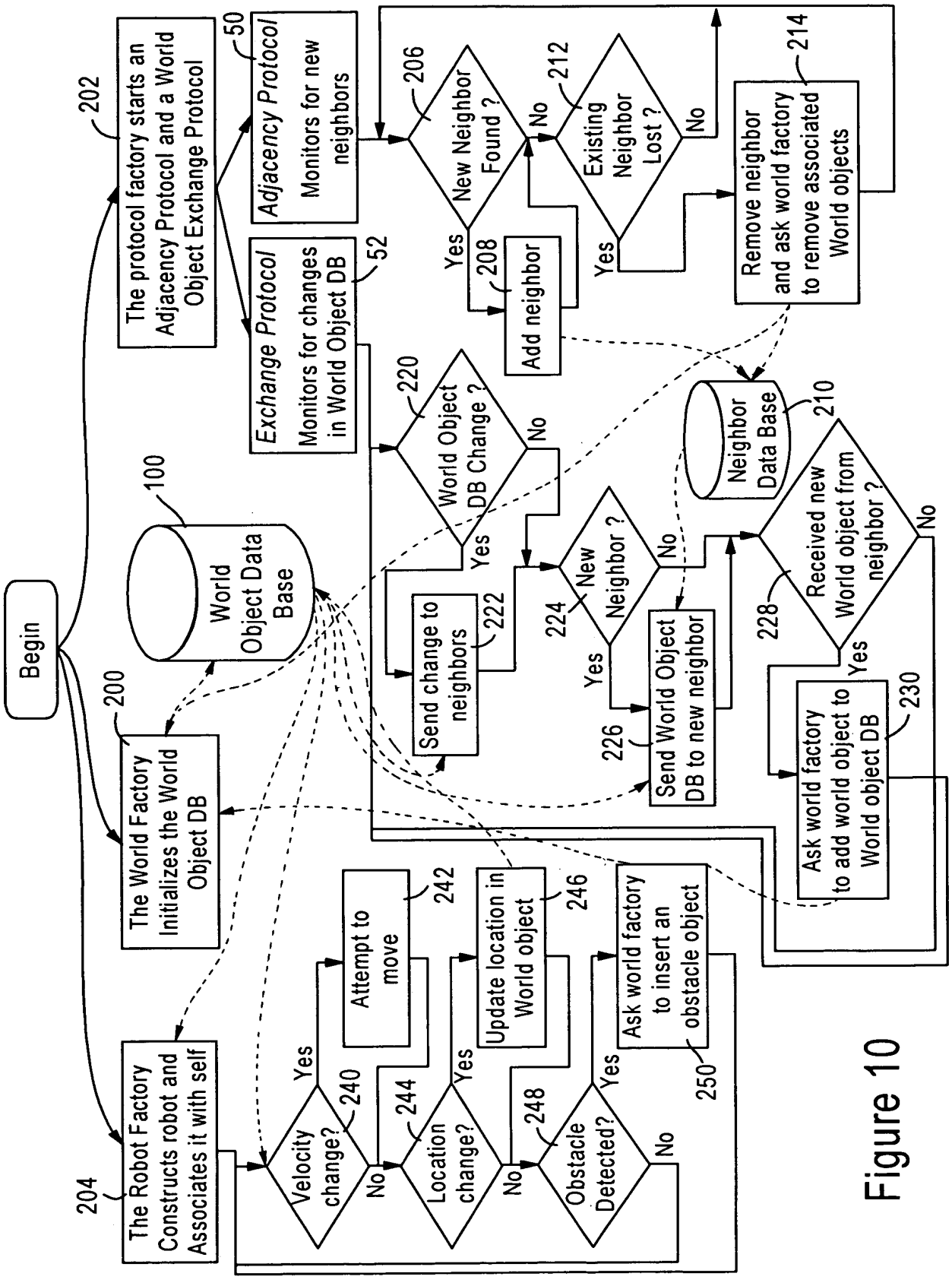
Begin
The protocol factory starts an Adjacency Protocol and a World Object Exchange Protocol
202
Adjacency Protocol
Monitors for new neighbors
50
Exchange Protocol
Monitors for changes in World Object DB
52
New Neighbor Found ?
206
Yes
No
Add neighbor
208
Existing Neighbor Lost ?
212
Yes
No
Remove neighbor and ask world factory to remove associated World objects
214
Neighbor Data Base
210
World Object Data Base
100
World Object DB Change ?
220
Yes
No
Send change to neighbors
222
New Neighbor ?
224
Yes
No
Send World Object DB to new neighbor
226
Received new World object from neighbor ?
228
Yes
No
Ask world factory to add world object to World object DB
230
The World Factory Initializes the World Object DB
200
The Robot Factory Constructs robot and Associates it with self
204
Velocity change?
240
Yes
No
Attempt to move
242
Location change?
244
Yes
No
Update location in World object
246
Obstacle Detected?
248
Yes
No
Ask world factory to insert an obstacle object
250

Figure 10